Binational Phosphorus Load Reduction Efforts to Prevent Lake Erie HABs

Tinka Hyde, EPA Region 5

Science Advisory Board Meeting

June 21, 2016

Outline

- Briefly review work to date under GLWQA Annex 4
- Next steps for Lake Erie phosphorus reduction targets
  - Eastern basin Cladophora
  - Binational phosphorus reduction strategy
  - Domestic action plans
  - Adaptive management framework
- Charge to SAB

1972

Great Lakes Water Quality Agreement

Protocol Amending the Agreement Between Canada and the United States of America on Great Lakes Water Quality, 1978, as Amended on October 16, 1983, and on November 18, 1987

Signed September 7, 2012

Canada

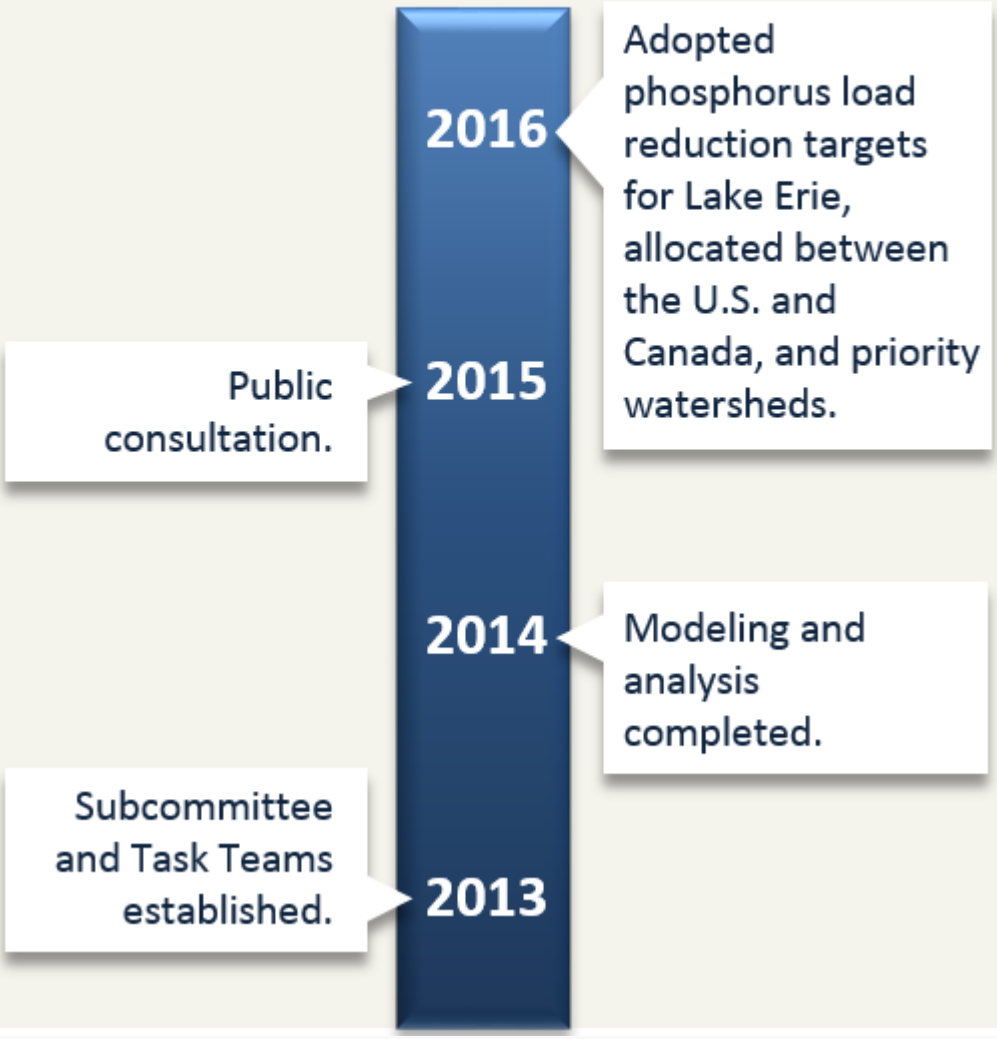
2012

Annex 4: Nutrients

In cooperation and consultation with stakeholders –

- Review, revise and/or develop concentration and loadings objectives for offshore and nearshore waters of Great Lakes **starting with Lake Erie**
- Establish allocations by country
- Establish load reduction targets for priority watersheds that have significant or localized impact
- Implement P reduction programs
- Monitor and report progress

Progress Toward Meeting GLWQA Commitments

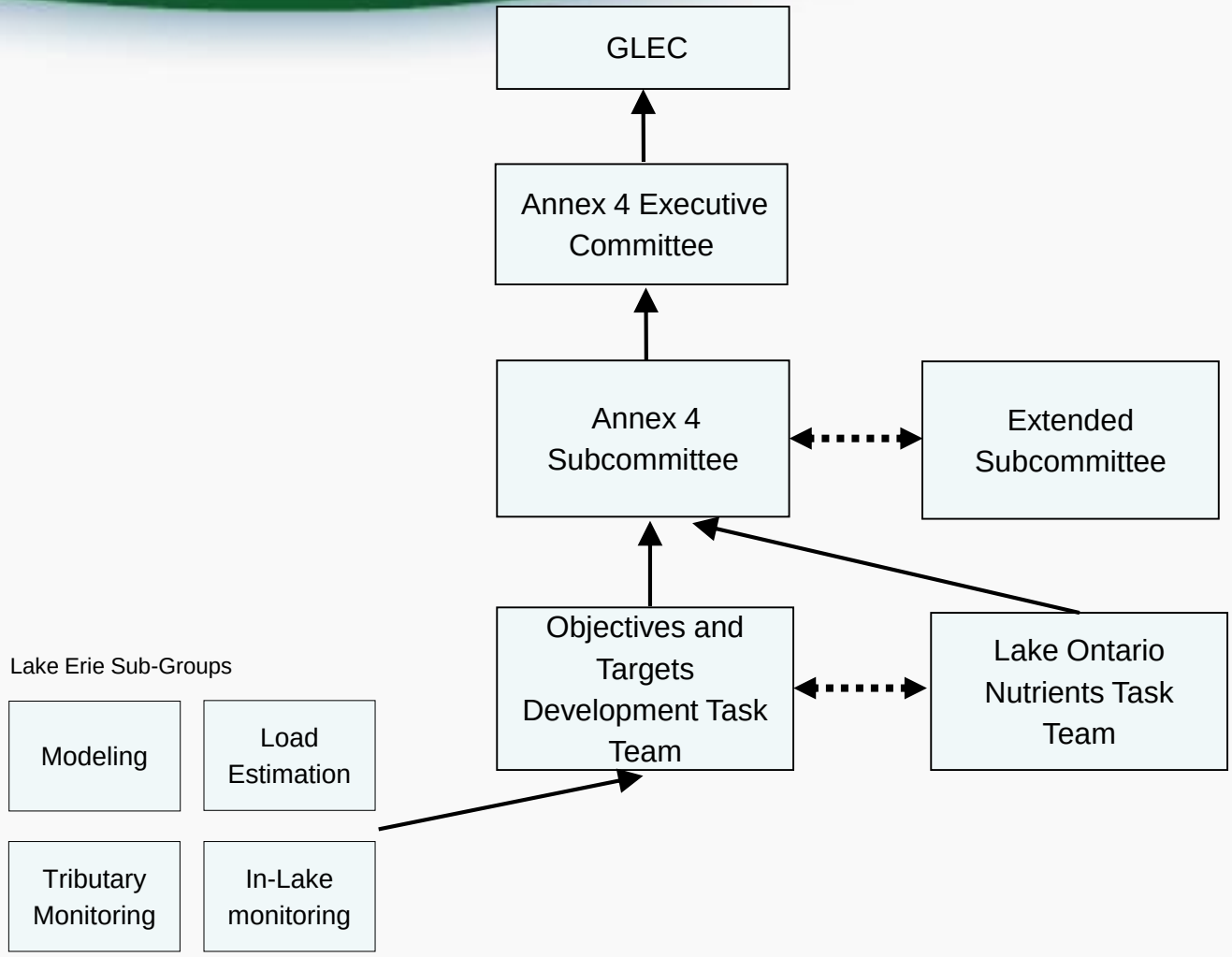


Targets Adopted February 2016

Binational Phosphorus Load Reduction Targets/Allocations

Lake Ecosystem Objectives Great Lakes Water Quality Agreement Annex 4, Section B	Western Basin of Lake Erie	Central Basin of Lake Erie
Minimize the extent of hypoxic zones in the Waters of the Great Lakes associated with excessive phosphorus loading, with particular emphasis on Lake Erie	40% reduction from 2008 loads in total phosphorus entering the Western Basin and Central Basin of Lake Erie – from the United States and from Canada - to achieve 6000 MT Central Basin load**.** **This amounts to a reduction from the United States and Canada of 3,316 metric tons and 212 metric tons, respectively**	
Maintain algal species consistent with healthy aquatic ecosystems in the nearshore Waters of the Great Lakes	40% reduction in spring total and soluble reactive phosphorus loads from the following watersheds where localized algae is a problem:	
	Thames River - Canada Maumee River - US River Raisin - US Portage River - US Toussaint Creek - US Leamington Tributaries – Canada	Sandusky River - US Huron River, OH – US
Maintain cyanobacteria biomass at levels that do not produce concentrations of toxins that pose a threat to human or ecosystem health in the Waters of the Great Lakes	40 % reduction in spring total and soluble reactive phosphorus loads from the Maumee River (U.S.)	N/A

Subcommittee Structure



June 2016

Schedule

Lake Erie Phosphorus Targets	Timeline
USEPA Science Advisory Board Early Advice (Phase 1)	December 2014 – May 2015
Draft Targets to GLEC Co-Chairs	May 2015
Public consultation	June - August 2015
Consideration of public input	September – November 2015
Final Targets to GLEC	December 2015
Targets Ratified	February 2016
USEPA SAB Peer Review (Phase 2)	June 2016 meeting Final report Oct-Dec 2016
Revisit Eastern basin target	Summer-fall 2016
Develop AM strategy	2016-2017
Domestic Action Plans	Drafts available for consultation during Summer 2016 – spring 2017 Finalize not later than 2018

Charge to SAB:

- Region 5 seeks your advice on:
  - Enhancements to the modeling approach, or new approaches to consider
  - Appropriateness of the targets to meet Lake Ecosystem Objectives
  - Eastern basin Cladophora
  - Nitrogen control
  - Evaluating progress

Thank you!

EXTRA SLIDES

Nutrients Annex Subcommittee

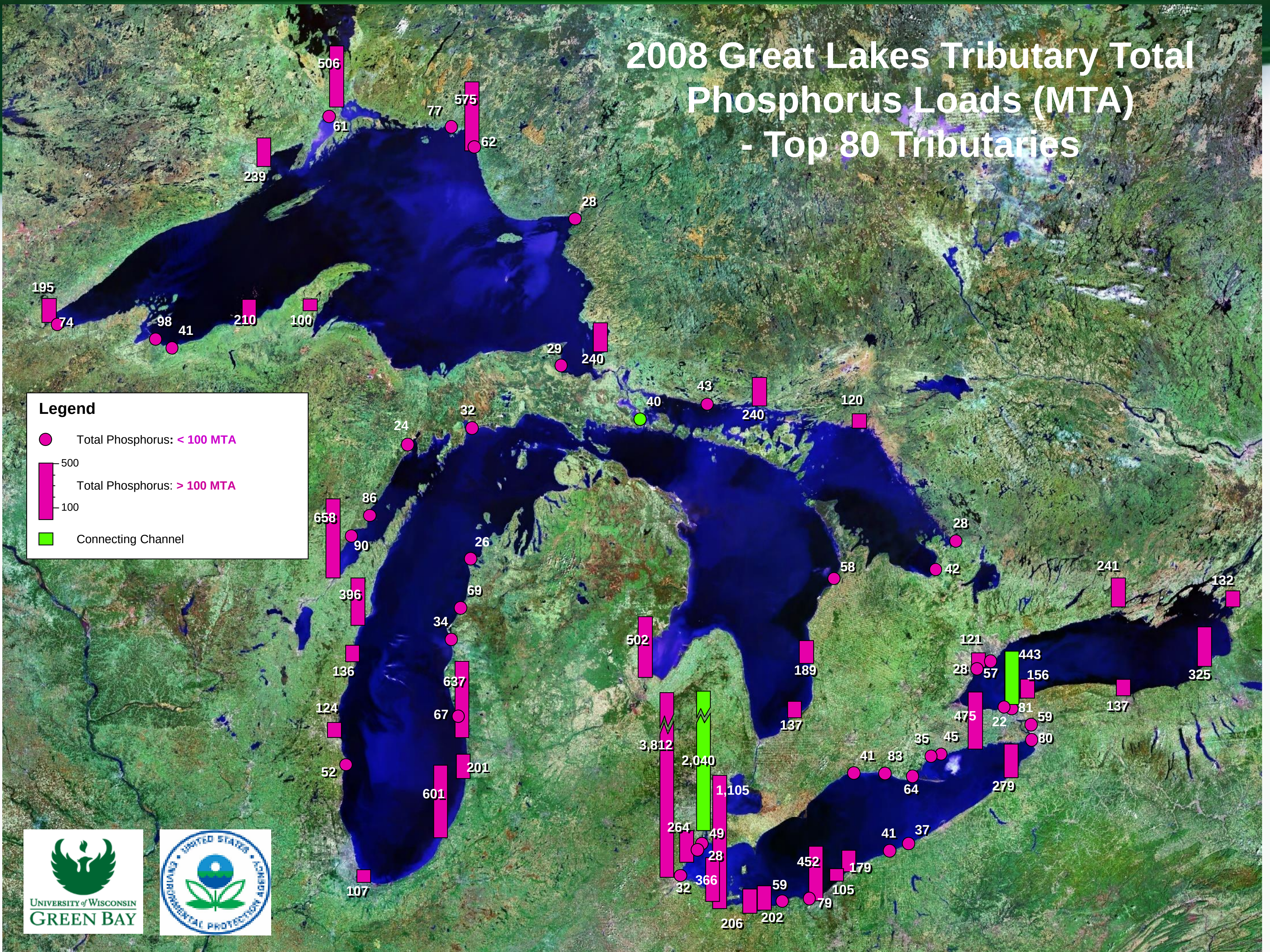
Agriculture and Agri-Food Canada

Agriculture et Agroalimentaire Canada

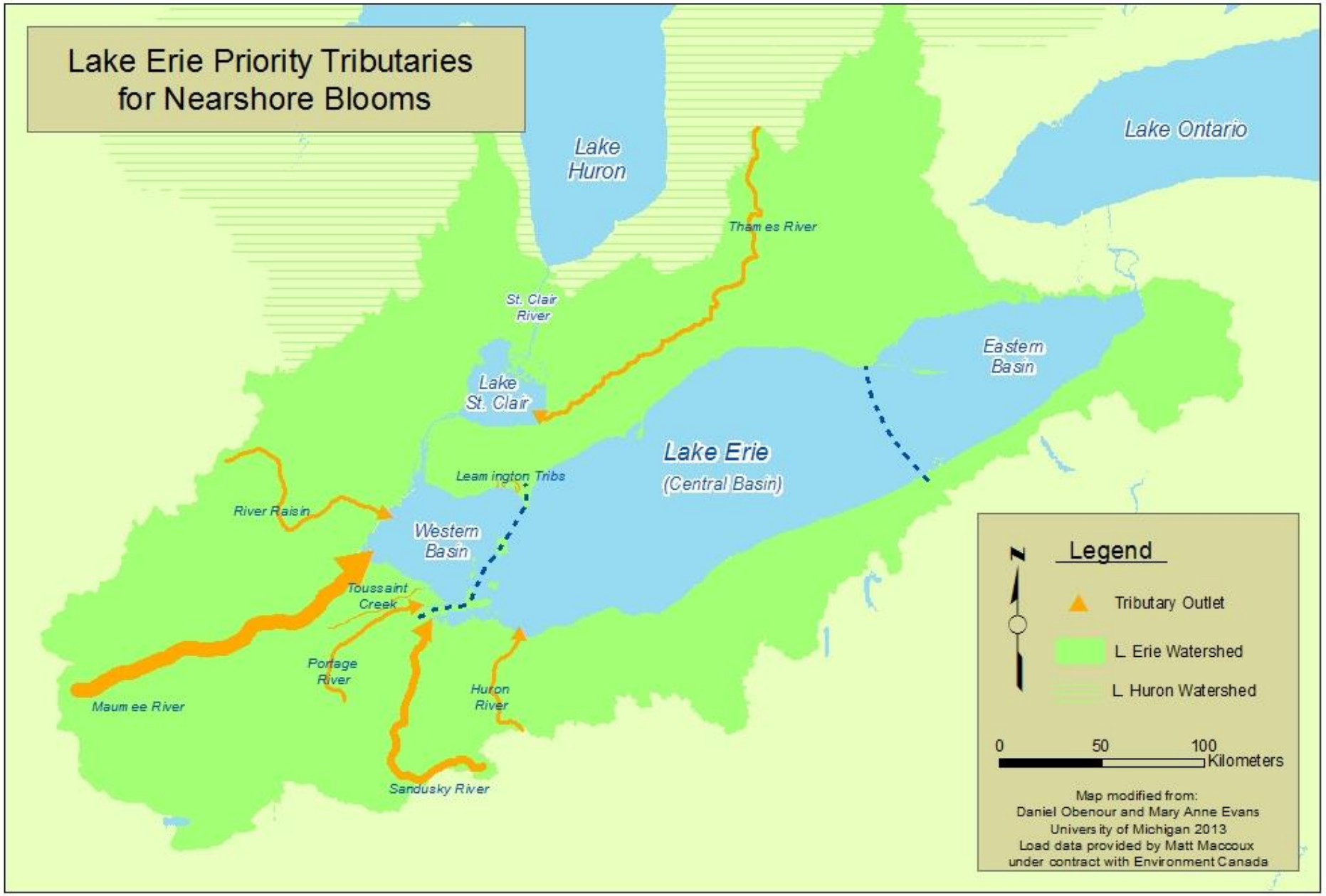
Environment and Climate Change Canada

Environnement et Changement climatique Canada

Ministry of the Environment and Climate Change


2008 Great Lakes Tributary Total Phosphorus Loads (MTA) - Top 80 Tributaries
Legend
Total Phosphorus: < 100 MTA
500
Total Phosphorus: > 100 MTA
100
Connecting Channel
506
61
575
77
62
239
28
195
74
98
41
210
100
29
240
43
240
40
120
32
24
86
658
90
26
69
396
34
136
637
67
124
52
201
601
107
502
3,812
2,040
1,105
189
137
58
28
42
241
132
121
443
28
57
156
325
475
22
81
59
137
80
35
45
41
83
64
279
264
49
28
32
366
206
59
202
452
79
105
179
41
37
University of Wisconsin
Green Bay
United States Environmental Protection Agency


Major Tributaries to Lake Erie
Total Phosphorus (TP) Load
2008 Water Year
(Oct 1, 2007 - Sept 30, 2008)
Lake Huron
Lake Ontario
Grand River
Thames River
Nanticoke River
St. Clair River
Sydenham River
Kettle Creek
Lynn River
Big Otter
Big Creek
Buffalo River
Clinton River
193
399
61
235
13
55
36
447
7
10
57
111
Eastern Basin
River Rouge
Lake St. Clair
Huron River
125
Detroit River
Cattaraugus Creek
Lake Erie
(Central Basin)
Swan Creek
Stony Creek
39
55
1987
River Raisin
262
Western Basin
3812
Ottawa Creek
359
1101
205
202
54
47
452
165
28
35
34
Conneaut Creek
Ashtabula River
Grand River
Chagrin River
Rocky
Black River
Vermilion River
Huron River
Portage River
Maumee River
Cuyahoga River
Sandusky River
Legend
2,000 (Metric Tons TP)
L. Erie Watershed
L. Huron Watershed
0
45
90
Kilometers
Contributers:
Santina Wortman, EPA
Daniel Obenour, UM/NCSU
Mary Anne Evans, USGS
Load data provided by Matt Maccoux
under contract with Environment Canada


Lake Erie Priority Tributaries for Nearshore Blooms
Lake Huron
Lake Ontario
Thames River
St. Clair River
Lake St. Clair
Eastern Basin
Lake Erie
(Central Basin)
Leamington Tribs
River Raisin
Western Basin
Toussaint Creek
Portage River
Maumee River
Huron River
Sandusky River
N
Legend
Tributary Outlet
L. Erie Watershed
L. Huron Watershed
0
50
100
Kilometers
Map modified from:
Daniel Obenour and Mary Anne Evans
University of Michigan 2013
Load data provided by Matt Maccoux
under contract with Environment Canada